

HP 5642 Rack User Guide



November 2004 (First Edition)
Part Number 366309-001

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Audience Assumptions

This document is for the person who installs racks and rack products. This procedure is performed only by trained personnel. HP assumes you are qualified in performing installations and trained in recognizing hazards in rack products.

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Overview

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HP 5642 Rack

The HP 5642 Racks offer the following features:

- Simple installation
- Split rear doors
- Split side panels
- Cable access area below rear door

Ordering Rack Options

In addition to the standard racks, HP also provides rack options to complement or complete your rack solution. The following list is only a sampling of the many rack option kits available. For information about ordering rack option kits visit the HP website (<http://www.hp.com/products/rackoptions>) or contact the nearest HP authorized reseller or service provider.

Rack Option	Description
Stabilizer Rack Option Kit	Increases the stability of free-standing racks, or for use with modified side feet
Baying Rack Option Kit	Joins multiple racks of the same series, height, and depth
Monitor/Utility Rack Option Kit	Holds a monitor or other rack component

Rack Option	Description
Server Console Switch	Programmable switch panel with connection hardware used to switch a keyboard, monitor, and mouse among multiple servers
1U Keyboard Drawer Option Kit	Holds and conceals a keyboard
100 Kilo Sliding Shelf Rack Option Kit	Allows easy access to various rack components
TFT5600 RKM	Rack-mountable 1U keyboard and flat-panel monitor on a drawer with room in the rear to add a switchbox
Blanking Panel Rack Option Kit	Covers open areas of the rack to better control airflow
TFT7210R Flat Panel Monitor Rackmount	Rack-mountable 1U flat-panel monitor with room in the rear to add a switchbox

Installation Overview

HP recommends the following sequence of events for the most safe and efficient installation of your rack and components.

1. Install the Customer Builder software from the HP website (<http://h30099.www3.hp.com/configurator/eco-cb/custombuilder.asp>). Using the Custom Builder, plan the rack component location and installation sequence.
2. Select a location to set up your rack. This should be the permanent site for your rack.
3. Assemble the rack. For your convenience, rack contents are packaged to follow the installation steps.
4. Stabilize the rack by adjusting the leveling feet.
5. Bay multiple racks together (recommended if more than one rack is being used side by side).
6. Install products, such as PDUs or console switches, in sidewall or 0U locations.

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7. Install products, such as UPS units, starting from the bottom of the rack.
 8. Install the appropriate support rails and tray for the first rack-mountable component.
 9. Install the first individual component.
 10. Attach a cable management arm if required.
 11. Attach the appropriate cables and power cords to the component, being sure to adhere to all cautions and warnings.
 12. Install the remaining components in the appropriate sequence.
 13. Reinstall any doors and side panels.
 14. Power up and configure the systems.

Installation Service

In the US, HP can make arrangements to have your rack system installed by qualified guaranteed service providers. This installation service covers the entire hardware installation sequence, from unpacking the components to routing cabling and running a test of the system. For more information, visit the HP website (<http://www.hp.com/products/racks>).

Assembling the HP 5642 Rack

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Maximum Load Capacity



CAUTION: Do not exceed the maximum load capacity, 680.38 kg (1,500 lb), for this rack.

Rack Caution

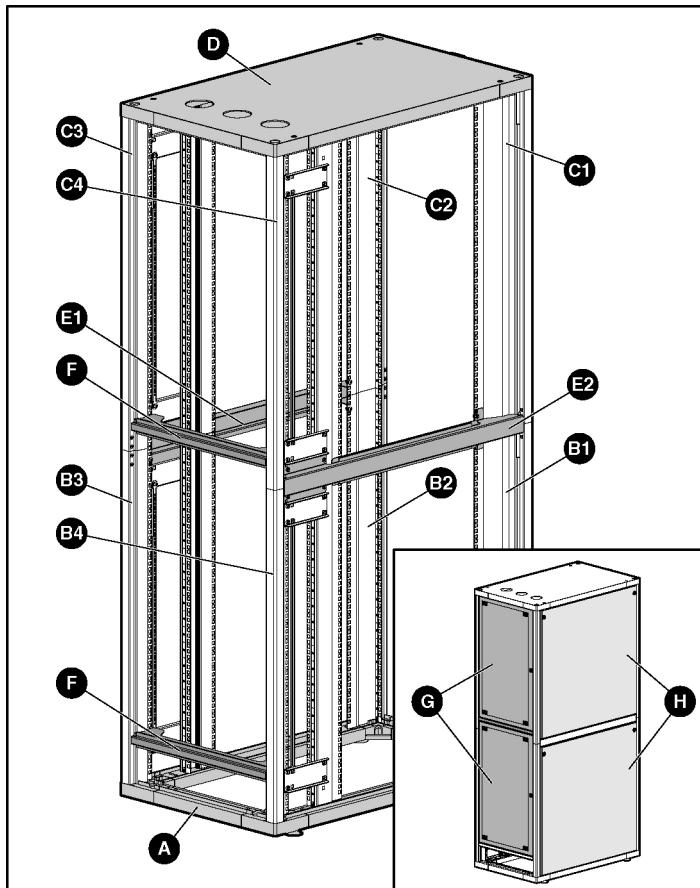


CAUTION: To reduce the risk of personal injury or damage to the equipment, be sure that:

- This procedure is performed after you have read these instructions completely.
- You select a location to set up your rack. This location should be as close as possible to the permanent site for your rack.
- The leveling feet are extended to the floor to stabilize the rack.
- Two or more people are available to lift and stabilize the product pieces during assembly.
- After you install the side panels, they are secured to the rack frame before releasing them.
- The maximum load capacity for this rack is 680.38 kg (1,500 lb).

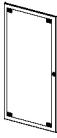
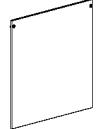
Kit Contents

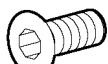
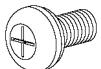
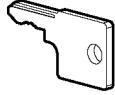
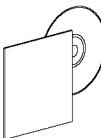
If any of the following items are missing or damaged, contact your HP authorized reseller. The following hardware pieces are included in this kit:



Identification	Quantity	Piece Description	Picture
A	1 piece	Rack base (with leveling feet already attached)	

B1	1 piece	Lower left front vertical frame piece	
B2	1 piece	Lower right front vertical frame piece	
B3	1 piece	Lower left rear vertical frame piece (with Retma rail attached)	
B4	1 piece	Lower right rear vertical frame piece (with Retma rail attached)	
C1	1 piece	Upper left front vertical frame piece	
C2	1 piece	Upper right front vertical frame piece	
C3	1 piece	Upper left rear vertical frame piece (with Retma rail attached)	

C4	1 piece	Upper left rear vertical frame piece (with Retma rail attached)	
D	1 piece	Rack top	
E1	1 piece	Right depth rail	
E2	1 piece	Left depth rail	
F	2 pieces	Rear door support	
G	2 pieces	Rear door	
H	4 pieces	Side panel	

I	1 bag	Bolts	
J	1 bag	Screws	
K	1 bag	Screws	
—	1 tool	Phillips screwdriver with socket tool	
—	1 tool	Allen wrench	
—	1 set	Key	
—	1 set	Documentation Kit	

Extra hardware might be included for your convenience.

Required Tools

The following tools are required for some procedures:

- Included with this kit
 - Allen wrench
 - Phillips screwdriver with socket tool
 - Keys
- Not included with this kit
 - Step ladder
 - Flat-head screwdriver (quarter-wide)

For comfort and efficiency while setting up your rack, use power tools where applicable.

Assembling the HP 5642 Rack



CAUTION: Be sure that the HP 5642 Rack parts are assembled in the correct locations according to the following illustrations.



CAUTION: Do not exceed the maximum load capacity, 680.38 kg (1,500 lb), for this rack.

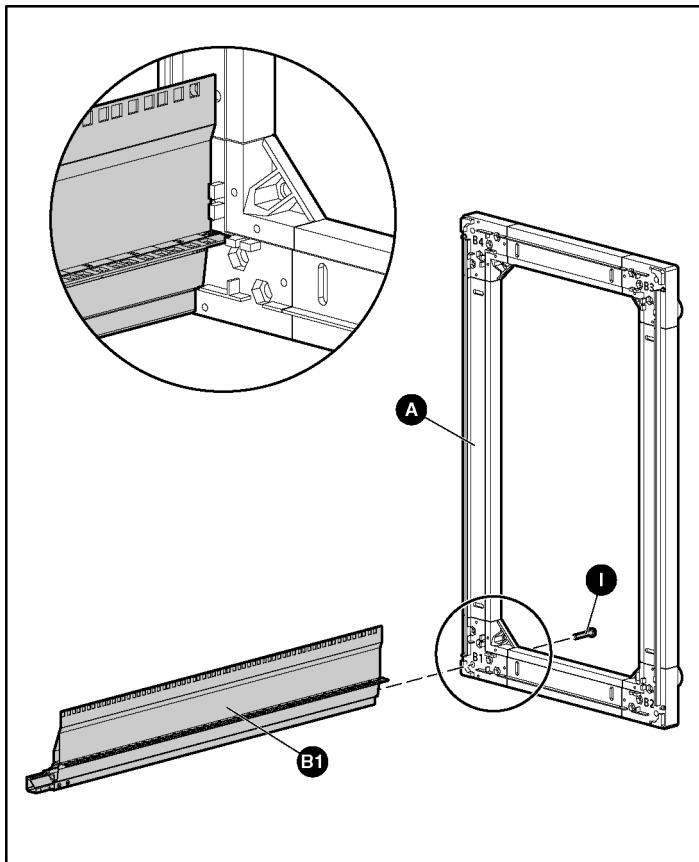
NOTE: For your convenience, the rack components are packaged to follow the installation steps.

1. Place the rack base **A** in the location you have selected for the HP 5642 Rack.
2. Adjust the leveling feet if necessary.

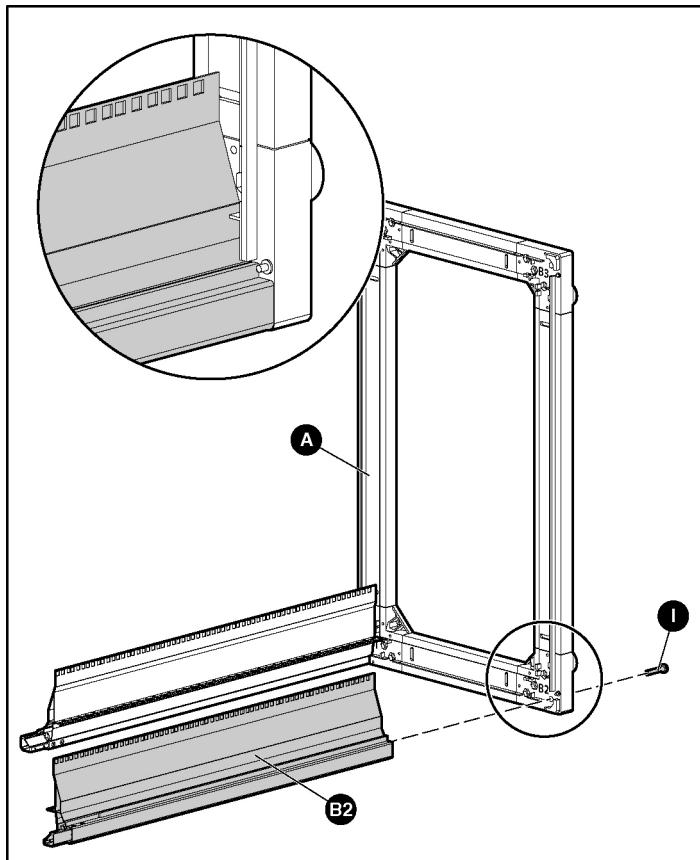


CAUTION: Two people might be needed to lift and stabilize certain components during this assembly.

3. Attach **B1** to **A** using one **I** hardware bolt. Fully tighten the **I** hardware bolt before proceeding to the next step.

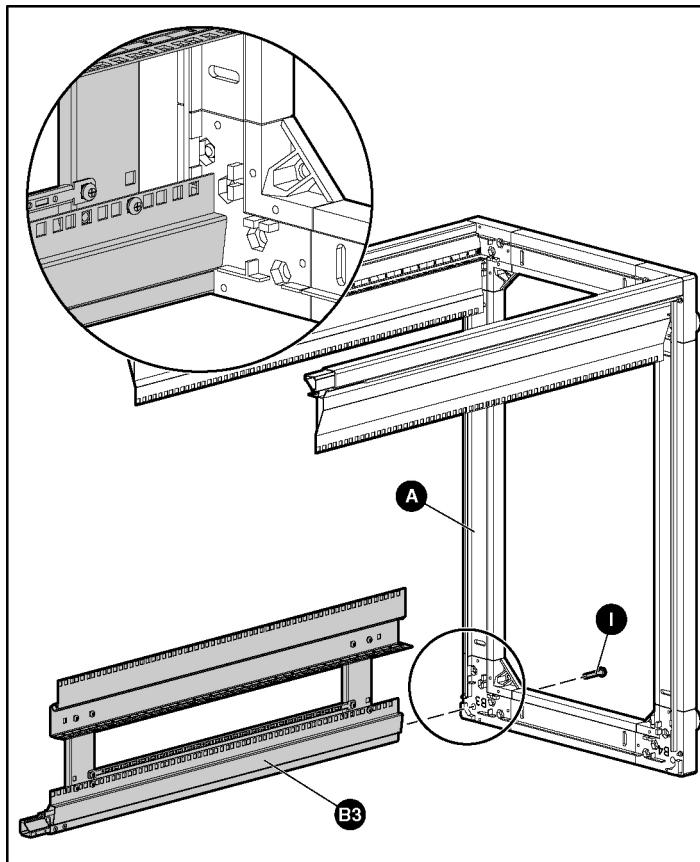


4. Attach **B2** to **A** using one **I** hardware bolt. Fully tighten the **I** hardware bolt before proceeding to the next step.



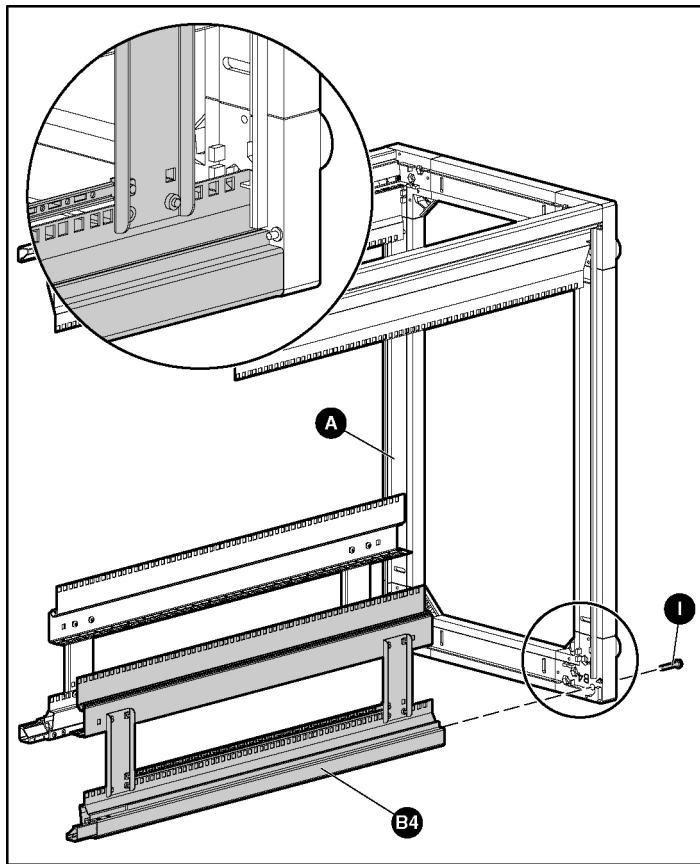
CAUTION: Two people might be needed to lift and stabilize certain components during this assembly.

5. Attach **B3** to **A** using one **I** hardware bolt. Fully tighten the **I** hardware bolt before proceeding to the next step.

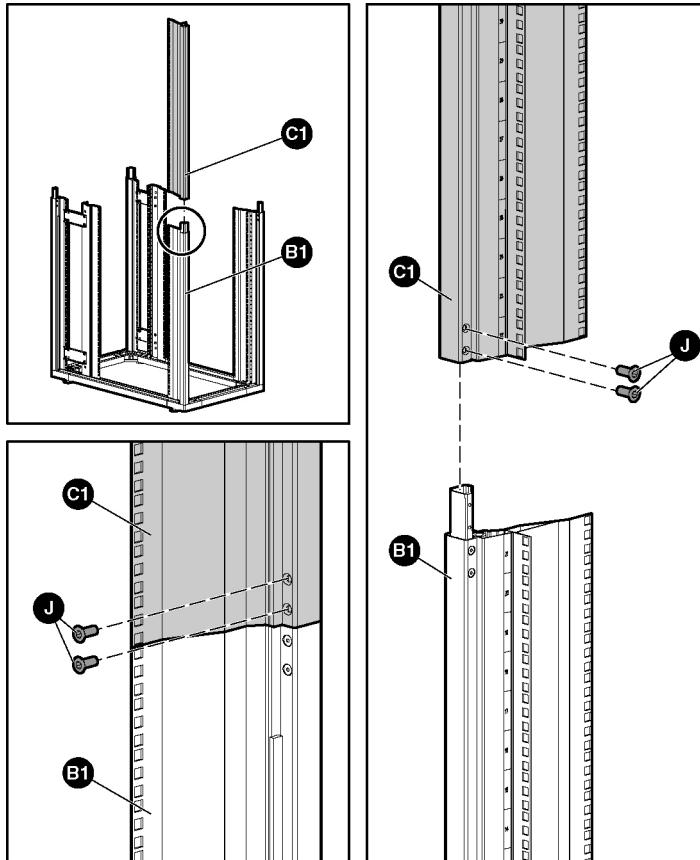


CAUTION: Two people might be needed to lift and stabilize certain components during this assembly.

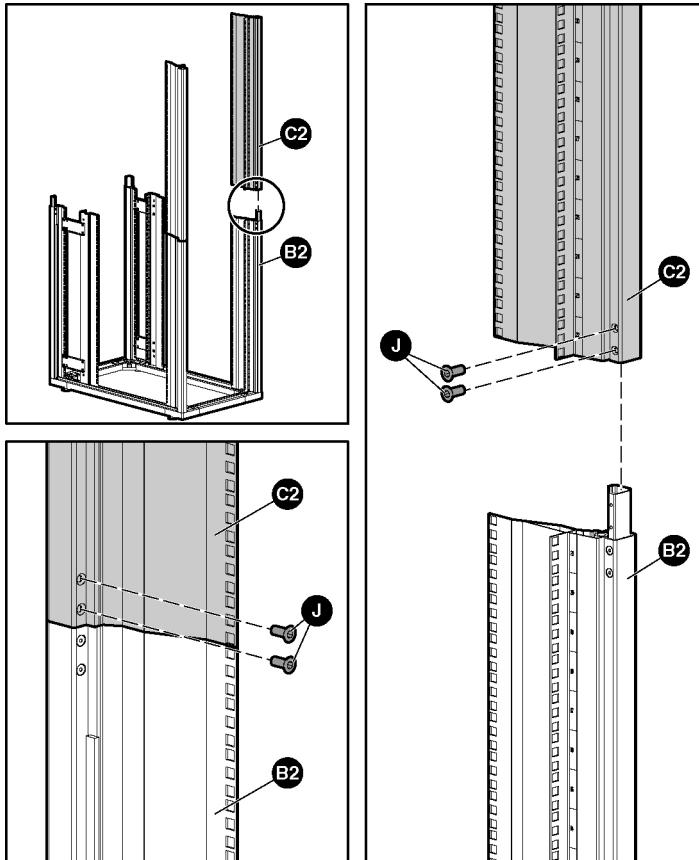
6. Attach **B4** to **A** using one **I** hardware bolt. Fully tighten the **I** hardware bolt before proceeding to the next step.



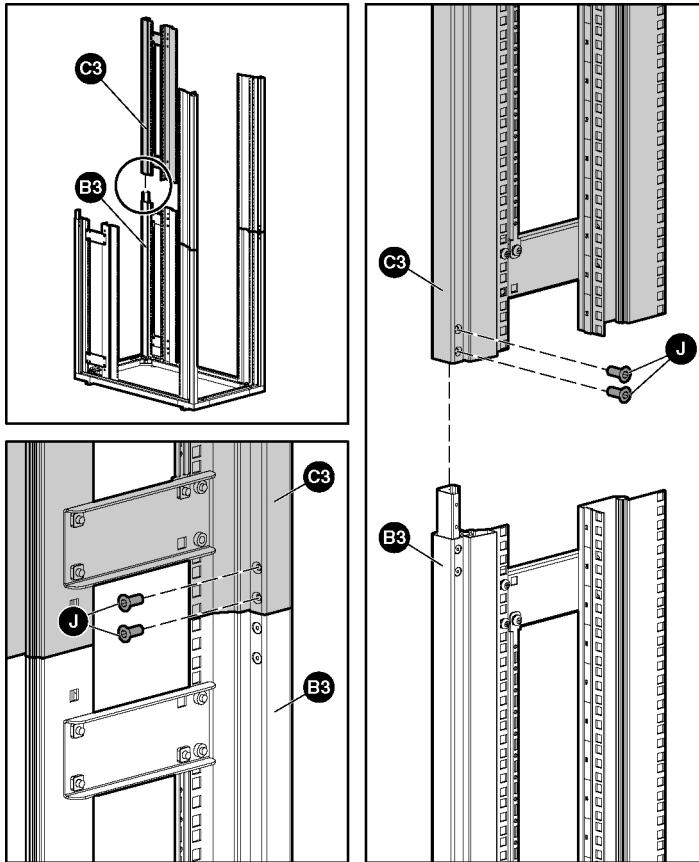
7. Attach **C1** to **B1** using four **J** hardware screws. Fully tighten the **J** hardware screws before proceeding to the next step.



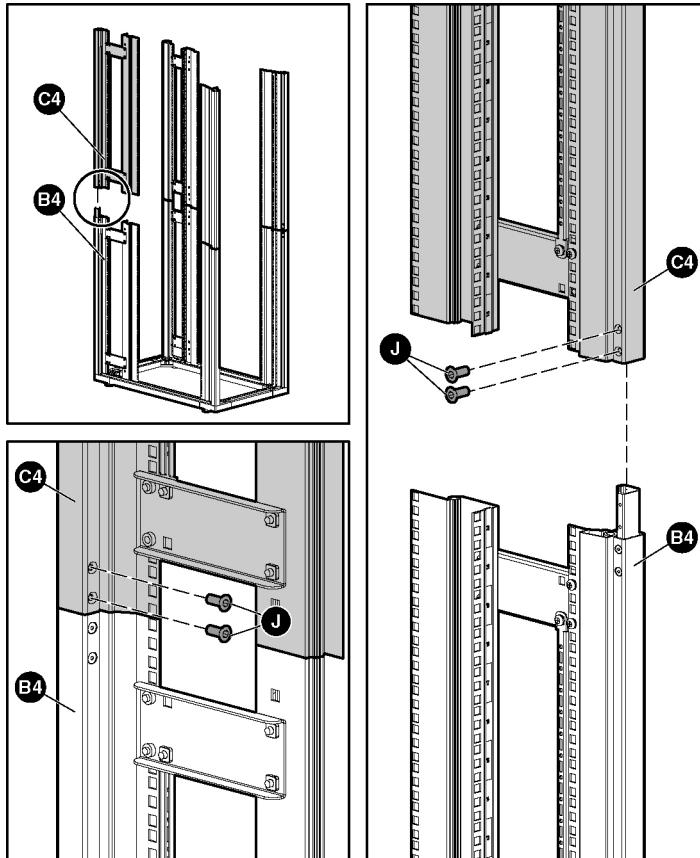
8. Attach **C2** to **B2** using four **J** hardware screws. Fully tighten the **J** hardware screws before proceeding to the next step.



9. Attach **C3** to **B3** using four **J** hardware screws. Fully tighten the **J** hardware screws before proceeding to the next step.

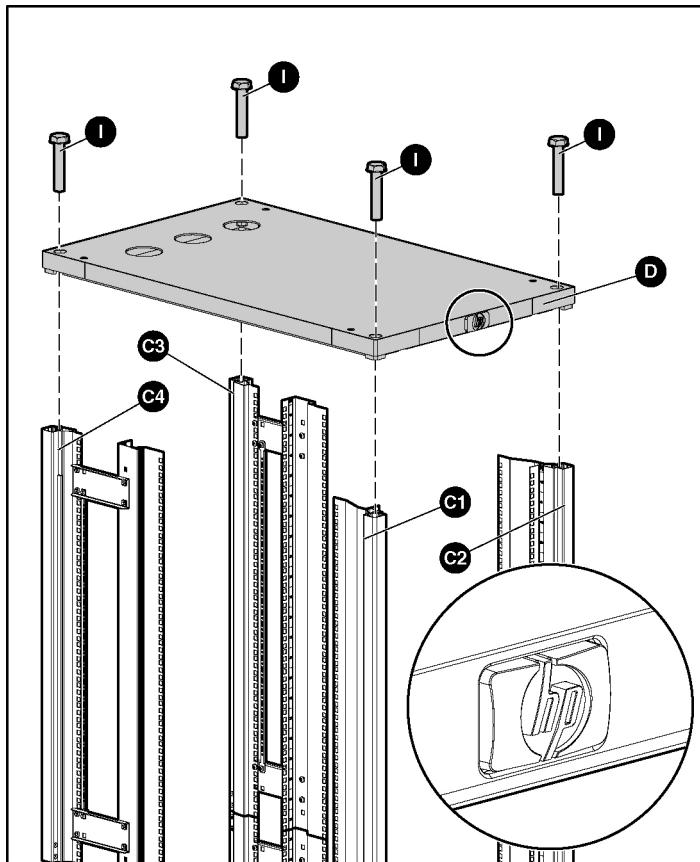


10. Attach **C4** to **B4** using four **J** hardware screws. Fully tighten the **J** hardware screws before proceeding to the next step.

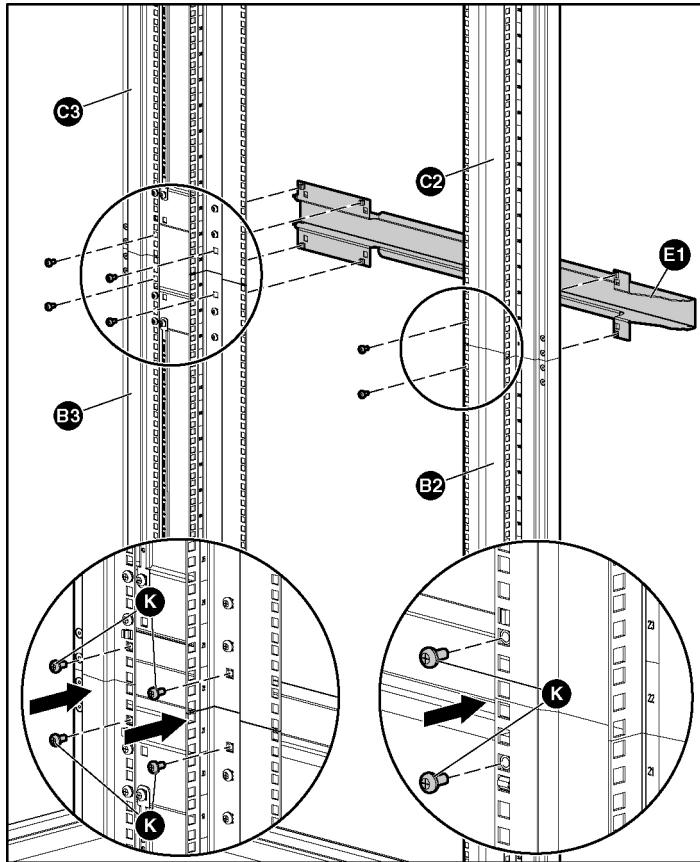


WARNING: Be sure that D is assembled in the correct location according to the following illustration. C1 and C2 should meet D where the HP logo is located, while C3 and C4 should meet D where the cable egress holes are located. The HP logo is on the front of the rack.

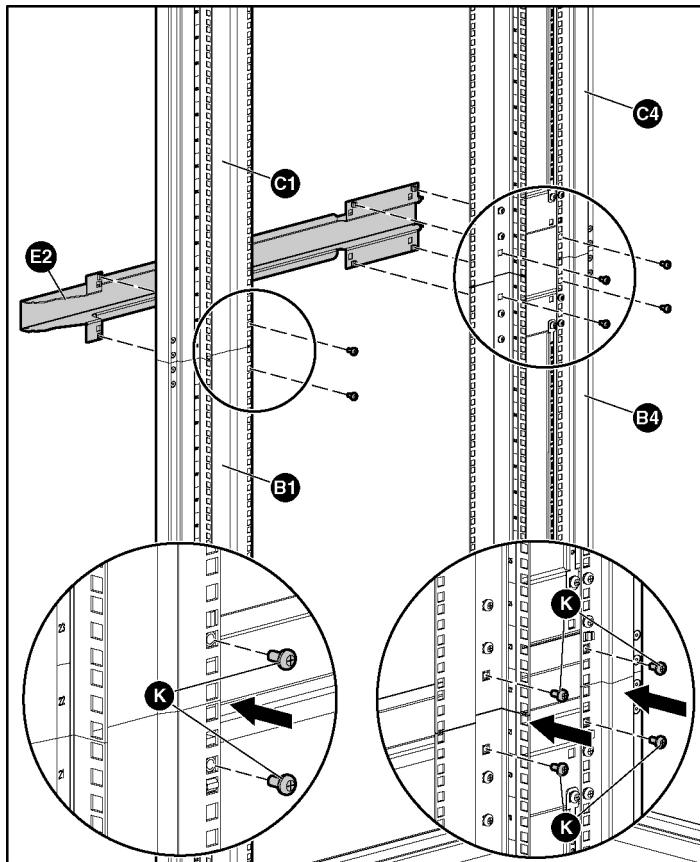
11. Attach **D** to **C1**, **C2**, **C3**, and **C4** using four **I** hardware bolts. Fully tighten the **I** hardware bolts before proceeding to the next step.



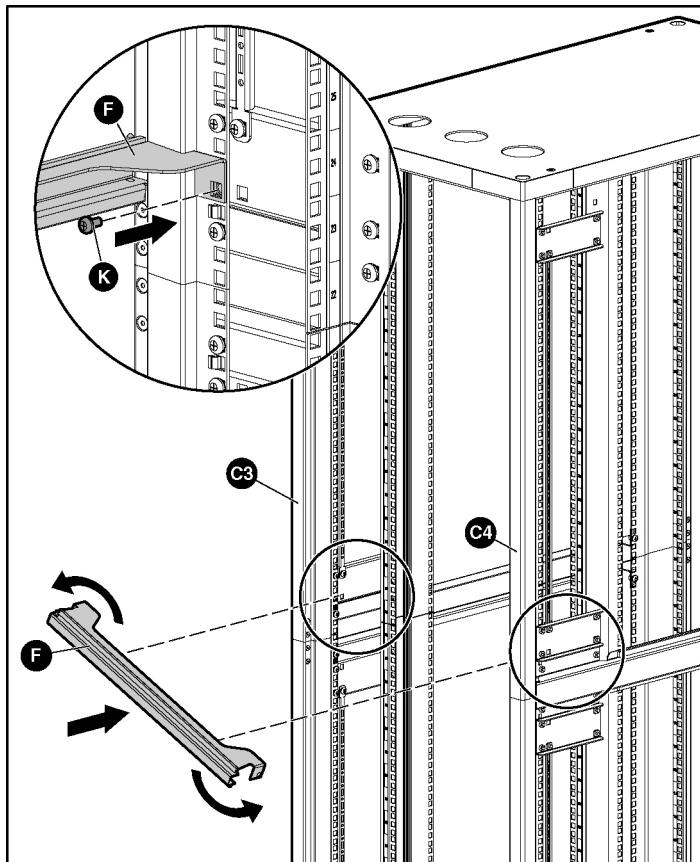
12. Attach **E1** to **C2**, **C3**, **B2**, and **B3** using six **K** hardware screws. Fully tighten the **K** hardware screws before proceeding to the next step.



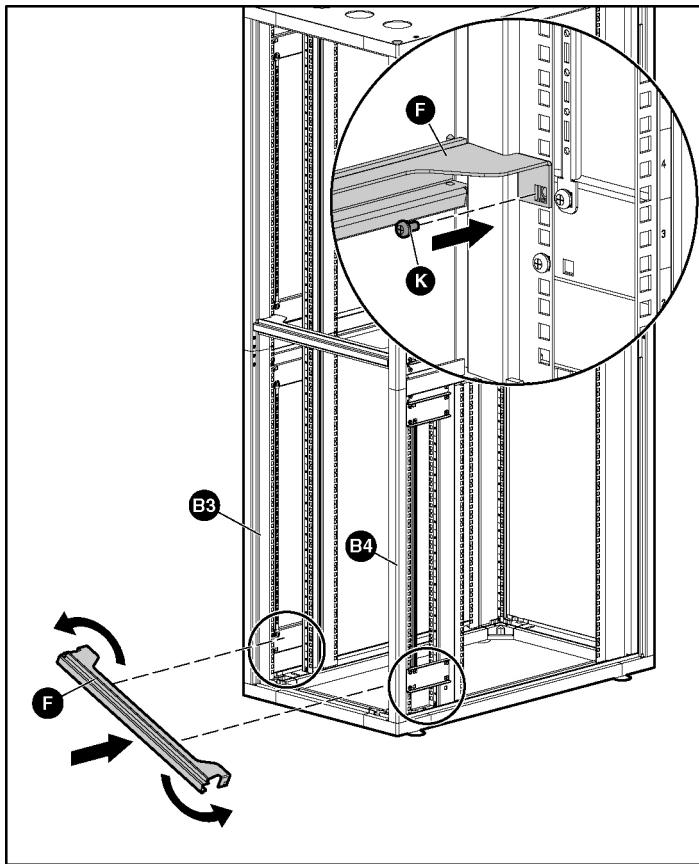
13. Attach **E2** to **B1**, **B4**, **C1**, and **C4** using six **K** hardware screws. Fully tighten the **K** hardware screws before proceeding to the next step.



14. Attach **F** to **C3** and **C4** using two **K** hardware screws. Fully tighten the **K** hardware screw before proceeding to the next step.



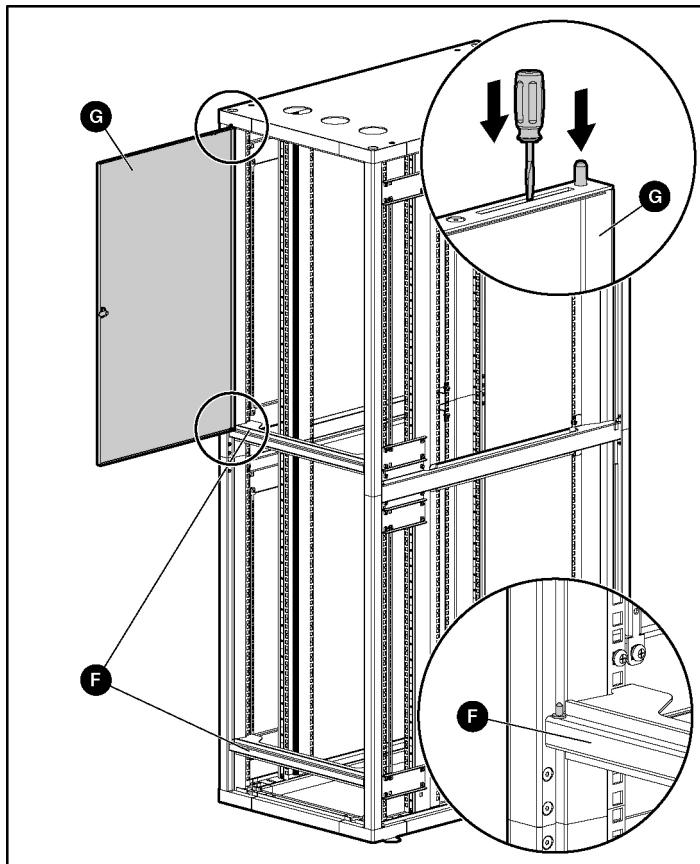
15. Attach **F** to **B3** and **B4** using two **K** hardware screws. Fully tighten the **K** hardware screws before proceeding to the next step.



16. Attach **G** to **F**.

- Position the bottom corner of **G** so that the pin on **F** is inserted into the hole on **G**.
- Using a tool, push down on the pin spring through the slot on **G** until the pin is de-pressed.
- Slide the top corner of **G** under the corner of the rack frame.
- Remove the tool from the slot on **G**. The pin pops into place.

- e. Repeat for the other **G** piece.

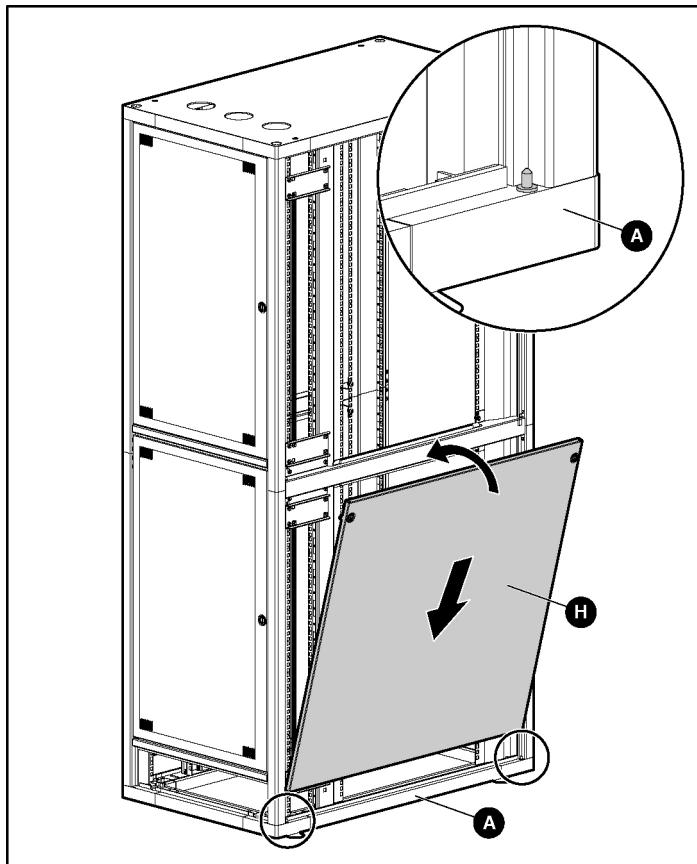


WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that the **H** pieces are secured to the rack frame by turning the quarter locks before releasing them.

17. Attach **H** to **A**.

- a. Position **H** so that the pins on **A** are inserted into the holes on **H**.
- b. Rotate **H** toward the rack.
- c. Using a tool, turn the quarter locks on **H** to latch it into place.

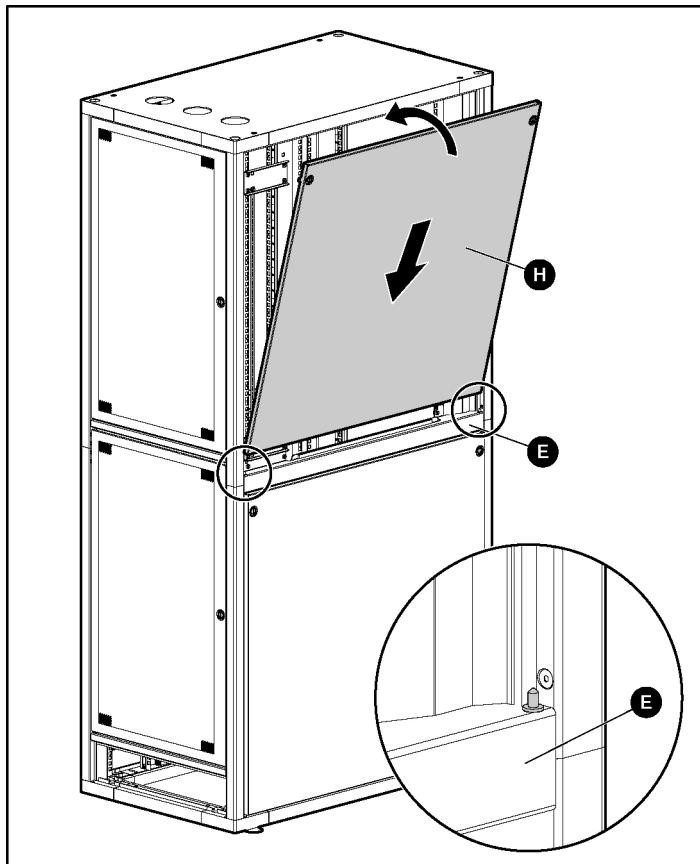
- d. Repeat for the other side of the rack.



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that the **H** pieces are secured to the rack frame by turning the quarter locks before releasing them.

18. Attach **H** to **E**.
- Position **H** so that the pins on **E** are inserted into the holes on **H**.
 - Rotate **H** toward the rack.
 - Using a tool, turn the quarter locks on **H** to latch it into place.

d. Repeat for the other side of the rack.



Installation is complete.

Configuration Factors

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Maximum Load Capacity



CAUTION: Do not exceed the maximum load capacity, 680.38 kg (1,500 lb), for this rack.

Rack Caution



CAUTION: To reduce the risk of personal injury or damage to the equipment, be sure that:

- This procedure is performed after you have read these instructions completely.
- You select a location to set up your rack. This location should be as close as possible to the permanent site for your rack.
- The leveling feet are extended to the floor to stabilize the rack.
- Two or more people are available to lift and stabilize the product pieces during assembly.
- After you install the side panels, they are secured to the rack frame before releasing them.
- The maximum load capacity for this rack is 680.38 kg (1,500 lb).

Configuration Factors

Before populating your new rack, you must plan the placement of each component. Factors of each component, such as weight, accessibility, power, temperature, and airflow requirements, affect installation order and component placement in the rack.

Rack Configuration Software

To help you plan your rack configuration more efficiently, HP provides Custom Builder, a powerful Web-based service enabling you to build, store, and export end-to-end rack configurations. The latest version of the software is available on the HP website (<http://h30099.www3.hp.com/configurator/eco-cb/custombuilder.asp>).

Custom Builder Online Modes of Operation

Custom Builder has two modes of operation:

- Help-Me-Build-A-New-Solution Mode—Includes a simple interview session to help determine your rack and component needs, as well as the necessary power products and rack assembly devices needed to complete the final rack assembly
- Let-Me-Build-A-New-Solution-Myself Mode—Enables you to select the individual devices that are required for your rack configuration

Component Placement

Apply the following rules to the physical placement of components in the HP 5642 Rack:

- Weight—Sort all of the components by weight, placing the heaviest components at the bottom of the rack.
- KVM Switch—Mount the switch either behind the keyboard or within a sidewall cavity to provide a 0U space solution.
- RKM—Install the RKM at a level that is the correct ergonomic position where your shoulders and neck are relaxed.
- Monitor—Arrange the screen a minimum of 4Us above the keyboard tray.
- Rack-mountable flat-panel monitor—Select a position to accommodate the desired viewing height (a minimum of 4Us above the keyboard tray).
- Balance—Be sure to balance the weight load between the racks, placing the heaviest components at the bottom of the rack. For example, if you have several UPS units and several servers, do not put all of the UPS units into one rack. Distribute them evenly in the bottom positions of each rack.

For further information regarding component placement, refer to the Important Safety Instructions that are shipped with the rack. Also, refer to the Safety and Comfort Guide—Precautions for Server and Network Products on the HP website (<http://www.hp.com>) (search for Safety and Comfort Guide).

Additional Considerations

The following are additional items to consider, based on your specific rack configuration:

- Power—if a UPS is installed, do not exceed its output rating. Be sure to review the installation instructions provided with each component for important cautions and warnings.
- PDUs—Install PDUs before installing other components.

- Height—The height of the rack and of rack-mountable components is measured in U increments. When you are configuring your rack installation, remember that the total U measurement of the components you want to install cannot exceed the stated U height of the rack.
- Keyboard—The rack keyboard requires installation of a 1U Keyboard Drawer Rack Option Kit.
- Monitor—The monitor requires installation of a Monitor/Utility Shelf rack Option Kit unless you are using a rack-mountable flat-panel monitor.
- Server Console Switch—If a console switch is configured, use the CPU-to-console switch cable included with the server. The standard distance between the console switch and the keyboard, monitor, and mouse can vary by 3-, 7-, 12-, 20-, and 40-ft lengths.

NOTE: National electrical regulations governing the installation of building wiring require that an appropriate cable, meeting fire-safety standards, must be used any time cabling is routed:

- Through an overhead drop-ceiling
- Under raised flooring
- From room to room
- From floor to floor

Be sure that the cable jacket or sleeving is made of material that does not burn easily and does not exude toxic fumes when exposed to heat.

Be sure that the cable you have selected is appropriate for your installation site. If you require a U.S. plenum-rated (CL2P) cable, contact your local HP authorized reseller to obtain any of the following options:

- 149363-B21-20-foot plenum cable
- 149364-B21-40-foot plenum cable

- **Baying Rack Option Kits**—The number of baying kits needed to join a series of racks is one less than the number of racks in the suite. Each baying kit supplies parts to bay two cabinets on 600 mm (24 inches) center line spacing.
- **Side Panels**—Only one set of side panels is required for each row of bayed racks.
- **Stabilizing Kit**—A stand-alone rack requires a stabilizing kit.

Optimum Environment

Specific requirements for space, power, temperature, and airflow must be met to provide optimum performance with minimum maintenance for your rack environment.

For additional information, refer to the Best Practices document on the HP website (<http://www.hp.com>).

Space Requirements

When deciding where to place your rack:

- At least 1,219 mm (48 inches) of clearance is needed all the way around the pallet and above the rack to enable the removal of the packing material.
- At least 1,219 mm (48 inches) of clearance is needed in front of the rack to enable the door to open completely.
- At least 762 mm (30 inches) of clearance is needed in the rear of the rack to provide access to components.
- At least 380 mm (15 inches) of clearance is needed around a power supply to facilitate servicing.

Power Requirements

When planning for power distribution requirements for your rack configuration:

- The power load must be balanced between available AC supply branch circuits.
- The overall system AC current load must not exceed 80% of the branch circuit AC current rating.
- If a UPS is used, the load should not exceed 80% of the marked electrical current rating for the UPS.

This equipment must be installed in accordance with local and regional electrical regulations governing the installation of information technology equipment by licensed electricians. This equipment is designed to operate in installations covered by the Nation Electric Code (ANSI/NFPA-70, 1993) and the code for protection of Electronic Computer/Data Processing Equipment (NFPA-75, 1992).

For electrical power ratings on options, refer to the products rating label or user documentation supplied with that option.

Temperature Requirements

To ensure continued safe and reliable equipment operation, install or position the rack in a well ventilated, climate-controlled environment.

The operating temperature inside the rack is always higher than the room temperature and is dependent on the configuration of equipment in the rack. Check the TMRA for each piece of equipment before installation.



CAUTION: To reduce the risk of damage to the equipment when installing third-party options:

- Do not permit optional equipment to impede airflow around the HP 5642 Rack or to increase the internal rack temperature beyond the maximum allowable limits.
- Do not exceed the manufacturer's TMRA.

Airflow Requirements

HP rack-mountable products typically draw in cool air through the front and exhaust warm air out through the rear of the rack. The front door of the rack, therefore, must be adequately ventilated to enable ambient room air to enter the rack, and the rear door must be adequately ventilated to enable the warm air to escape the rack. Do not block the ventilation apertures.

Blanking Panels

If the front of the rack is not completely filled with components, the remaining gaps between the components can cause changes in the airflow, which can adversely affect cooling within the rack. Cover these gaps with blanking panels.

Multiple Racks

Increasing space and stability, HP 5642 Racks can be bayed together by installing the HP 5642 Baying Rack Option Kit. The HP 5642 Baying Rack Option Kit joins multiple racks of the same series, height, and depth.

Observe the following tips when using multiple-rack configurations:

- The stabilizing kit is optional with bayed racks.
- The number of baying kits needed is one less than the total number of racks.
- Position and install either baying option kit before populating the racks with components.

Installing Components

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General Guidelines

IMPORTANT: HP strongly recommends that you configure the rack using the Custom Builder (<http://h30099.www3.hp.com/configurator/eco-cb/custombuilder.asp>) before beginning the installation process.



WARNING: To reduce the risk of personal injury or damage to the equipment, adequately stabilize the rack before extending a component outside the rack. Extend only one component at a time. A rack may become unstable if more than one component is extended.



WARNING: To reduce the risk of personal injury or damage to the equipment, always load the heaviest item first from the bottom of the rack up. This makes the rack bottom-heavy and helps prevent the rack from becoming unstable. Refer to Configuration Factors (on page [32](#)).



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- **The leveling feet are extended to the floor.**
- **The full weight of the rack rests on the leveling feet.**
- **The stabilizing feet are attached to the rack if it is a single-rack installation.**
- **The racks are coupled together in multiple-rack installations.**
- **Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.**



CAUTION: To reduce the risk of damage to the equipment when installing third-party options:

- Do not permit optional equipment to impede airflow around the HP 5642 Rack or to increase the internal rack temperature beyond the maximum allowable limits.
- Do not exceed the manufacturer's TMRA.

Observe the general guidelines when loading your components:

- For detailed instructions on installing specific component or third-party hardware, refer to the user documentation that was shipped with that component.
- Before installing components into the rack, refer to Electrostatic Discharge (on page [51](#)).
- Use the configuration prepared by the Custom Builder as a guideline for installation components.
- Load the heavier components first from the bottom of the rack.
- Be sure to balance the weight load between bayed racks. For example, if you have several UPS units and several servers, do not pull all of the UPS units into one rack. Instead distribute them evenly in the bottom positions of each rack.
- Allow a minimum clearance of 76 cm (30 inches) between the wall and the rear of the rack to provide adequate access for installation and service.

Preparing the Rack for Component Installation

- Checking the Hardware (on page [41](#))
- Removing the Side Panels (on page [41](#))
- Removing the Rack Doors (on page [43](#))

Checking the Hardware

After unpacking the component to be installed, locate the documentation that was shipped with that component. Verify that you received all of the listed hardware pieces.

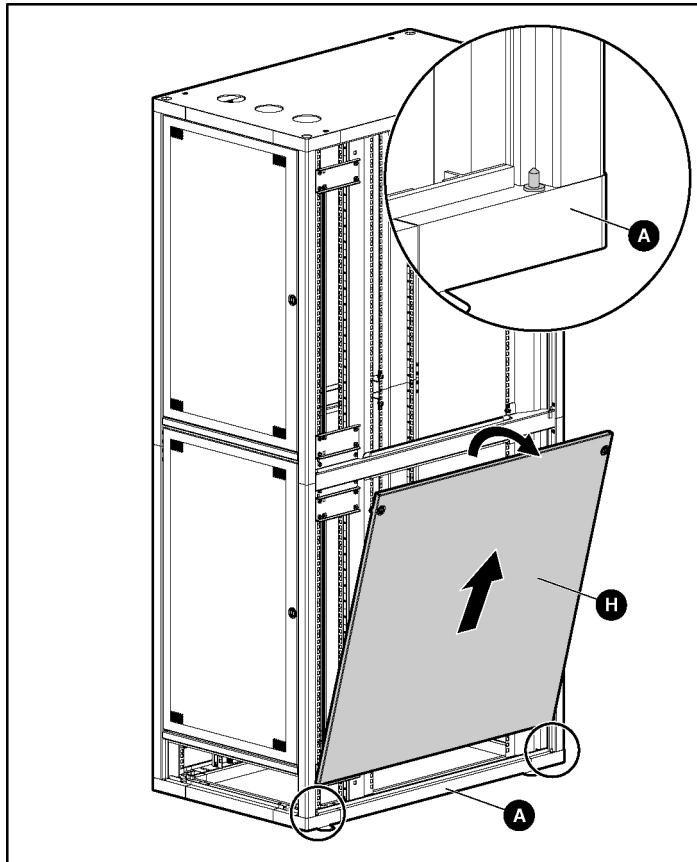
You will typically have extra fasteners after completing your component installation.

IMPORTANT: Retain the extra fasteners for future use.

Removing the Side Panels

1. Remove **H** from **A**.
 - a. Place one of your palms on **H**. Using your other hand and a tool, turn the quarter-turn locks on **H** to unlatch **H**.
 - b. Slowly rotate **H** so that you are able to remove it from the pins on **A**.

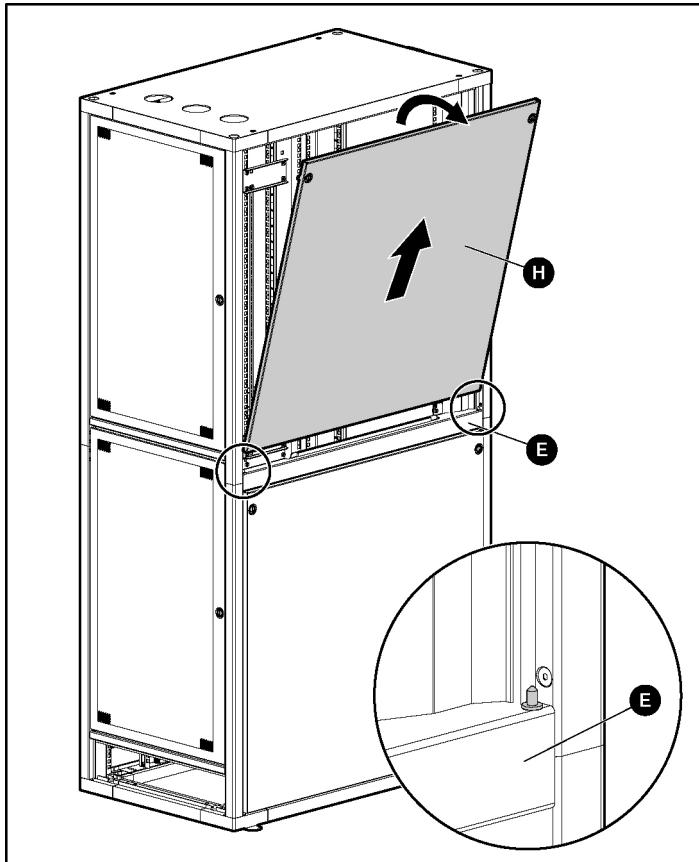
c. Repeat for the other side of the rack.



2. Remove **H** from **E**.

- a. Place one of your palms on **H**. Using your other hand and a tool, turn the quarter-turn locks on **H** to unlatch **H**.
- b. Slowly rotate **H** so that you are able to remove it from the pins on **E**.

- c. Repeat for the other side of the rack.



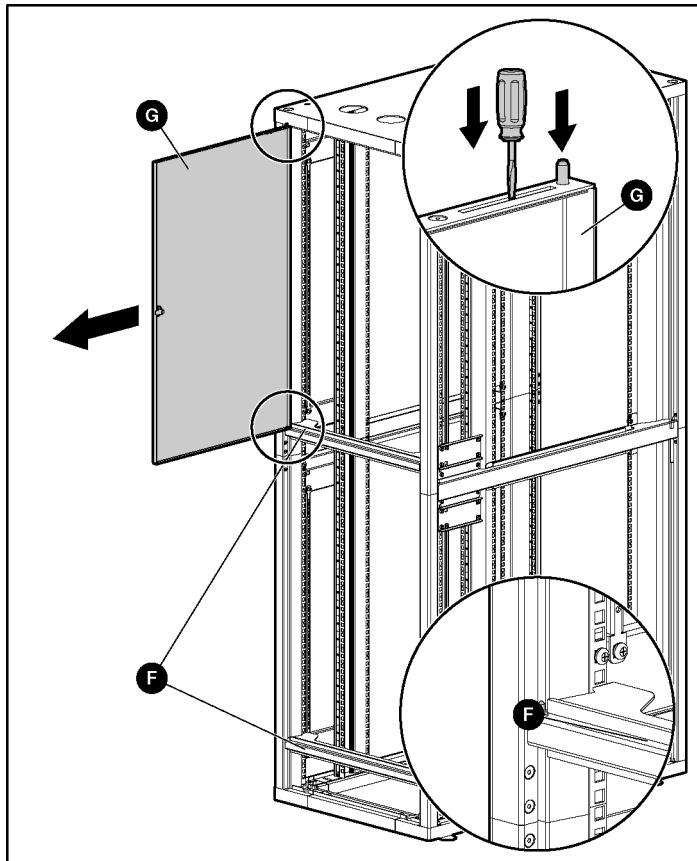
Removing the Rack Doors

To provide access to all sides of the rack while you are installing the various components, first remove the rack doors. If your rack has side panels, also remove them before installing mounting brackets and other hardware.

To remove the rear rack doors:

1. Using a tool, push down on the pin spring through the slot on **G**.
2. Slide the top corner of **G** out from under the corner of the rack.

3. Remove the tool from the slot on **G**.
4. Remove the bottom corner of **G** from the pin on **F**.



Installing Components

NOTE: Install the stabilizer foot before any component.

IMPORTANT: These installation instructions are for standard installations. For specific installation instructions, refer to the documentation included with your component.

The following steps outline the sequence for installing rack-mountable components in a rack. Install 0U devices first, such as PDUs, console switches, and so on.

1. Use the rack template ("Using the Rack Template" on page [45](#)) to measure and mark the rack for correct placement of the installation hardware.
2. Install the cage nuts ("Installing the Cage Nuts" on page [46](#)) into the rack (if required).
3. Prepare and install the rails into the rack.
4. Prepare and install the component into the rack and secure it.
5. Install the component into the rack and secure it.
6. Attach the cable management arm to the rack and then to the component.
7. Attach any cables and power cords, being sure that you adhere to all cautions and warnings contained in the individual component installation instructions.
8. Remove the cable access panel and route the cables.

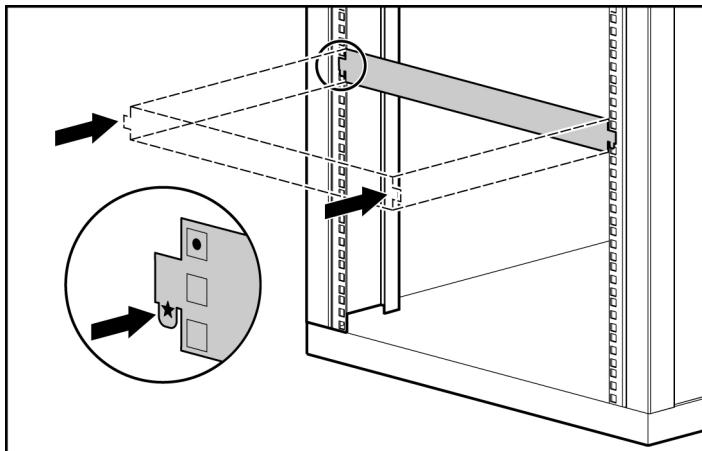
Using the Rack Template

Use the template that was shipped with your rack-mountable component to mark the location of the mounting hardware on the mounting rails of the rack.

Align the lower edge of the rack template with the top of the previous rack component, and push the tabs in to hold the rack template in place. Mark the rack to indicate where the components are to be located.



CAUTION: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.



NOTE: Rack components are removed for clarity.

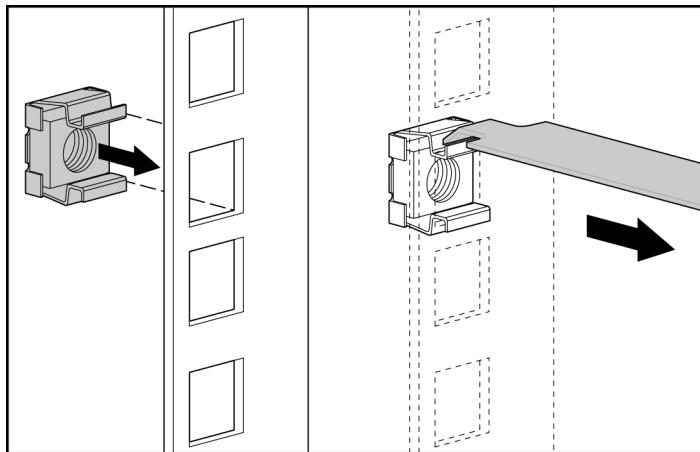
Installing the Cage Nuts

Use the cage nut insertion tool to install the cage nuts on the inside of the mounting rails.

NOTE: The cage nut insertion tool and the cage nuts are not included with this rack.

1. Hook the bottom lip of the cage nut in the square-rail perforation.
2. Insert the tip of the insertion tool through the perforation, and hook the top lip of the cage nut.

3. Use the insertion tool to pull the cage nut through the hole until the top lip snaps into position.



Specifications

In This Section

HP 5642 Rack Specifications[49](#)

HP 5642 Rack Specifications

U height	Width	Depth	Static Load	Shipping Options	Color
42 U	600 mm (23.62 in.)	1000 mm (39.37 in.)	680.38 kg (1,500 lb)	Flat ship (-B21)	Graphite metallic

Electrostatic Discharge

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Preventing Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods to Prevent Electrostatic Discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm \pm 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact your authorized reseller.

Technical Support

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HP Contact Information

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- In other locations, refer to the HP website (<http://www.hp.com>).

For HP technical support:

- In North America:
 - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
 - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website (<http://www.hp.com>)
- Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, refer to the HP website (<http://www.hp.com>).

Before You Contact HP

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)

- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

Acronyms and Abbreviations

KVM

keyboard, video, and mouse

PDU

power distribution unit

RKM

rackmount keyboard monitor

TMRA

recommended ambient operating temperature

UPS

uninterruptible power system

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